

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Inquiry Concerning Deployment of Advanced)	GN Docket No. 18-238
Telecommunications Capability to All Americans)	
in a Reasonable and Timely Fashion)	

COMMENTS OF CTIA

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TABLE OF CONTENTS

I.	INTRODUCTION AND SUMMARY.....	1
II.	BY ANY RATIONAL MEASURE, MOBILE WIRELESS BROADBAND DEPLOYMENT IS REASONABLE AND TIMELY.....	4
	A. The Commission Appropriately Focuses This Inquiry on Progress in Deployment.....	4
	B. U.S. Providers Continue to Invest in and Deploy Mobile Broadband Coverage and Capacity.....	5
	1. 4G LTE Networks, Critical to the Future of Connectivity, Continue to Expand Throughout the U.S.....	5
	2. Continued Investment in and Expansion of 4G LTE Leads to Ever-Increasing Consumer Coverage, Even as Providers Begin to Deploy 5G.....	7
	C. Mobile Wireless Services Have Become Central to American Consumers' Lives as the Wireless Industry Continues to Innovate and Deploy.	13
	D. The Rapid Growth in the Internet of Things Is Supported by the Reasonable and Timely Deployment of Mobile Wireless Broadband Services.	16
III.	THE COMMISSION SHOULD CONSIDER AVAILABLE DATA, RATHER THAN RIGID BENCHMARKS, TO DETERMINE THAT MOBILE WIRELESS BROADBAND DEPLOYMENT IS REASONABLE AND TIMELY.	17
	A. The Data Show that Mobile Wireless Broadband Deployment Is Meeting and Exceeding Consumers' Demands.	18
	B. CTIA Continues to Support the Commission's Efforts to Enhance the Quality of Public Data on Broadband Availability, Including Through the Form 477 Data Collection Process.....	21
IV.	TO ENSURE MOBILE WIRELESS BROADBAND DEPLOYMENT REMAINS REASONABLE AND TIMELY, THE COMMISSION SHOULD MAINTAIN A PRO-DEPLOYMENT REGULATORY ENVIRONMENT.....	22
	A. The Commission Should Continue to Modernize its Siting Policies to Advance the Deployment of Wireless Infrastructure.....	23
	B. Allocating More Low-, Mid-, and High-Band Spectrum for Exclusive Licensed Use Remains Critical to Continued Reasonable and Timely Deployment of Mobile Broadband.	25
	C. The Commission Should Move Forward With Mobility Fund Support for Unserved Rural Areas.	26
V.	CONCLUSION.	27

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CTIA¹ respectfully submits these Comments in response to the Federal Communications Commission's (Commission's) *Fourteenth Broadband Deployment Report Notice of Inquiry* in the above-captioned docket.²

I. INTRODUCTION AND SUMMARY.

By any rational measure, the Commission should find that the deployment of advanced telecommunications capabilities by mobile wireless providers is reasonable and timely. In its *2018 Broadband Progress Report* earlier this year, the Commission rightly concluded that the deployment of advanced telecommunications capabilities, including by mobile wireless

¹ CTIA® (www.ctia.org) represents the U.S. wireless communications industry and the companies throughout the mobile ecosystem that enable Americans to lead a 21st-century connected life. The association's members include wireless carriers, device manufacturers, suppliers as well as apps and content companies. CTIA vigorously advocates at all levels of government for policies that foster continued wireless innovation and investment. The association also coordinates the industry's voluntary best practices, hosts educational events that promote the wireless industry, and co-produces the industry's leading wireless tradeshow. CTIA was founded in 1984.

² *Inquiry Concerning Deployment of Advanced Telecommunications Capabilities to All Americans in a Reasonable and Timely Fashion*, Fourteenth Broadband Deployment Report Notice of Inquiry, GN Docket No. 18-238, FCC 18-119 (rel. Aug. 9, 2018) (*NOI*); *see also Communications Marketplace Report et al.*, Order, GN Docket Nos. 18-231, -238, DA 18-859 (rel. Aug. 17, 2018) (setting revised comment and reply comment dates in response to the *NOI*).

providers, was reasonable and timely.³ The *2018 Broadband Progress Report* appropriately recognized that “advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion,” and that “we are back on the right track when it comes to deployment.”⁴

Since the *2018 Broadband Progress Report*, mobile wireless providers have continued to expand the scope and capacity of mobile broadband networks, prompting consumers to increasingly make mobile wireless services and devices the nerve center of their daily lives. Providers have further deployed their 4G LTE networks into more rural and underserved areas, expanding opportunities. These 4G LTE networks will remain the pillars of wireless carriers’ efforts to serve consumers well into the future. And while an ever-increasing number of Americans continue to benefit from the expanding pace of 4G LTE deployment, the race to 5G has begun. Providers have started to deploy various forms of 5G networks, with initial commercial deployments scheduled to begin this year. Supported by the expanding deployment of mobile broadband networks, the use of the Internet of Things (IoT) continues to expand. Overall, the continued expansion and scope of mobile broadband networks have allowed consumers to lead a mobile-centered lifestyle with enormous benefits, including for rural and low-income consumers, people with disabilities, older adults, and veterans.

³ *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, 2018 Broadband Deployment Report, 33 FCC Rcd 1660, 1662 ¶ 6, 1707-708 ¶ 94 (2018) (*2018 Broadband Progress Report*).

⁴ *2018 Broadband Progress Report*, 33 FCC Rcd at 1707-708 ¶ 94.

In the *2018 Broadband Progress Report*, the Commission appropriately used a progress-based approach to assess the reasonableness and timeliness of broadband deployment.⁵ In measuring the continued deployment of mobile broadband for this report, the Commission should focus on metrics that reflect available data, rather than arbitrary definitions and benchmarks. Further, CTIA continues to support the Commission’s efforts to enhance the quality of public data on broadband availability, including through the Form 477 data collection process.⁶

CTIA further commends the Commission’s efforts to pursue regulatory policies that have promoted the reasonable and timely deployment of mobile broadband networks—and more can be done to continue this forward momentum. For example, the *Restoring Internet Freedom Order* was an important step to restoring confidence, and incenting investment and innovation, by removing an unnecessary and burdensome regulatory framework.⁷ Other recent Commission actions have been similarly beneficial.⁸ The Commission can take further steps to ensure that mobile broadband deployment remains reasonable and timely, including: continuing to modernize siting policies to advance wireless infrastructure deployment; allocating more low-, mid-, and high-band spectrum for exclusive licensed use; and moving forward as quickly as possible with MF-II support.

⁵ See *id.* at 1663 ¶¶ 10-11 (explaining the statutory reasons for the *2018 Report*’s progress-based evaluation).

⁶ See, e.g., Comments of CTIA, WC Docket No. 11-10 (filed Oct. 10, 2017) (CTIA 477 Comments).

⁷ See, e.g., *Restoring Internet Freedom*, Declaratory Ruling, Report and Order, and Order, 33 FCC Rcd 311 (2018) (*Restoring Internet Freedom Order*); see also Comments of CTIA, WC Docket No. 17-108, at 7-28 (filed July 17, 2017).

⁸ See *infra* Section IV.

Ultimately, the Commission’s 2019 Broadband Progress Report should affirmatively find that mobile wireless broadband is being reasonably and timely deployed, in light of both the evidence of the rapid and consumer-satisfying pace of mobile wireless broadband deployment—including continuing 4G LTE deployment and forthcoming 5G connectivity.

II. BY ANY RATIONAL MEASURE, MOBILE WIRELESS BROADBAND DEPLOYMENT IS REASONABLE AND TIMELY.

A. The Commission Appropriately Focuses This Inquiry on Progress in Deployment.

The Commission is correct to focus its examination again this year on whether advancement in the deployment of advanced telecommunications capability is reasonable and timely—a “progress-based approach.”⁹ Congress required the agency to report on an annual basis “whether advanced telecommunications capability *is being deployed* to all Americans in a reasonably timely fashion.”¹⁰ This formulation in the annual reporting requirement indicates that Congress intended for the Commission to report on the ongoing progress of deployment.¹¹ Were it Congress’s intent to seek Commission input on the *completeness* of deployment, Congress would be expected to direct the Commission to report on whether advanced telecommunications capability “*has been*” deployed in a reasonable and timely fashion—which it did not. CTIA therefore agrees with the proposal in the *NOI* that the Commission conduct this inquiry, as it did last year, by measuring progress over the past five years.¹²

⁹ *NOI* at 3 ¶ 7.

¹⁰ 47 U.S.C. § 1302(b) (emphasis added).

¹¹ See, e.g., *2018 Broadband Progress Report*, 33 FCC Rcd at 1663 ¶¶ 10-11 (noting in part Congress’s use of the present progressive tense).

¹² See *NOI* at 3 ¶ 7.

B. U.S. Providers Continue to Invest in and Deploy Mobile Broadband Coverage and Capacity.

1. 4G LTE Networks, Critical to the Future of Connectivity, Continue to Expand Throughout the U.S.

Wireless providers remain focused on improving the quality and expanding the capacity of their networks to meet consumers' growing demand for wireless connectivity and data consumption. These efforts have been a resounding success story for U.S. consumers, who benefit from the greater availability and functionality of wireless services. Progress has been clear: A record 323,448 cell sites were in operation in 2017 (representing an increase of 52 percent over the last decade), and almost all of the country's population now has access to advanced wireless services.¹³ Indeed, 4G LTE service is now available to at least 99.7 percent of Americans, and covers more than 73 percent of the total U.S. land area.¹⁴ As the next big step, wireless providers are trialing 5G technologies and equipment, and are announcing commercial rollouts as well.¹⁵

Moreover, the expanding deployment of mobile broadband is helping to close the digital divide, as wireless providers both regional and nationwide are investing in providing coverage to underserved and unserved communities across the country. Providers continue to improve the scope and speed of their coverage in rural and high-cost areas to offer the most comprehensive nationwide coverage and support services addressing the needs of rural America. Metrics from the Commission's most recent mobile wireless competition reports reflect this improvement in

¹³ CTIA, THE STATE OF WIRELESS 2018 20 (July 2018), available at https://api.ctia.org/wp-content/uploads/2018/07/CTIA_State-of-Wireless-2018_0710.pdf (STATE OF WIRELESS 2018).

¹⁴ *Id.* at 13.

¹⁵ See *infra* Section II.B.2.

rural coverage. Last year, the Commission estimated that approximately 84.2 percent of the rural population was covered by at least three LTE service providers.¹⁶ This represents a 3.6 percentage point increase from the prior year,¹⁷ and a 19.4 percentage point increase from the statistics reported in 2015.¹⁸ Significantly, this positive trend is expected to continue, and the deployment of services using 600 MHz band spectrum will be key in this effort.¹⁹

Expanded rural coverage yields not only the wide range of benefits that accompany increased access to the internet, but also provides targeted services such as smart agriculture and telemedicine. As Commissioner Brendan Carr observed, with the help of “broadband-enabled, smart ag applications . . . farmers are seeing at least a 30% increase in productivity and crop yields, not to mention a significant reduction in the use of fertilizer, pesticides, and water.”²⁰

¹⁶ See, *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 et al.*, Twentieth Report, 32 FCC Rcd 8968, Table III.D.xi (2017) (*Twentieth Mobile Competition Report*).

¹⁷ See, *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 et al.*, Nineteenth Report, 31 FCC Rcd 10534, Table III.A.v (2016) (*Nineteenth Mobile Competition Report*).

¹⁸ *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 et al.*, Eighteenth Report, 30 FCC Rcd 14515, Table III.A.v (2015) (*Eighteenth Mobile Competition Report*).

¹⁹ See, e.g., Comments of CTIA, WT Docket No. 18-203, at 32-34 (filed July 26, 2018) (CTIA Mobile Competition Comments).

²⁰ Brendan Carr, *From Farm to Cloud: How Broadband Makes Smart Ag Brilliant*, Medium (May 25, 2018), <https://medium.com/@BrendanCarrFCC/from-farm-to-cloud-how-broadband-makes-smart-ag-brilliant-ae41a08cc04f>.

2. Continued Investment in and Expansion of 4G LTE Leads to Ever-Increasing Consumer Coverage, Even as Providers Begin to Deploy 5G.

Even as 4G LTE networks continue to expand nationwide and will remain the cornerstone of consumer mobile service, U.S. wireless carriers are also already beginning to deploy the next generation of wireless connectivity, which will improve the performance of mobile networks for particular applications. Wireless operators have implemented such technological advances as massive multiple-input and multiple-output (“MIMO”), carrier aggregation, and 256 QAM modulation in order to deliver faster speeds, improved spectral efficiency and greater capacity, as part of the evolution of 4G LTE towards Gigabit LTE and 5G.²¹

As Qualcomm Technologies’ VP of Engineering John Smee has said, “LTE Advanced lays the foundation for what’s going to come with 5G.”²² T-Mobile has reported deploying LTE Advanced in more than 920 markets, “with a combination of carrier aggregation, 4x4 MIMO and 256 QAM now live in 430 of those markets.”²³ AT&T announced earlier this year that its 5G Evolution, which uses “LTE-Advanced 4×4 multiple-input multiple-output, 256 QAM and 3-component carrier aggregation” to produce 1 Gbps peak downlink speeds, was deployed in a

²¹ Sean Kinney, *The state of gigabit LTE in the U.S.*, RCRWIRELESS (Jan. 24, 2018), at <https://www.rcrwireless.com/20180124/carriers/state-of-gigabit-lte-in-the-us-tag17-tag99>.

²² Sean Kinney, *Laying the groundwork for 5G with LTE*, RCRWIRELESS (April 4, 2018), at <https://www.rcrwireless.com/20180404/5g/laying-groundwork-for-5g-with-lte-tag17>.

²³ Monica Allevan, *T-Mobile Fires Up LTE-A in 920 Markets, Gigabit LTE in 430 Markets*, FIERCE WIRELESS (Nov. 9, 2017), at <https://www.fiercewireless.com/wireless/t-mobile-fires-up-lte-a-920-markets-gigabit-lte-430-markets>.

total of 141 markets.²⁴ Verizon has also been expanding the reach of its LTE Advanced network relying on carrier aggregation, 4x4 MIMO, and 256 QAM modulation.²⁵

Parallel to the advances noted above, in 2017, nationwide carriers announced deployments of License-Assisted Access (“LAA”) which, like its predecessor LTE-U, pairs licensed spectrum with unlicensed spectrum.²⁶ LAA is considered an enabler for much higher download speeds using a supplemental channel with as little as 20 megahertz of licensed spectrum.²⁷ Testing has shown that devices with LAA support a consistently higher data rate, with three-times faster download speeds.²⁸ All major carriers have tested LAA and reportedly achieved speeds ranging from 120 Mbps (using only five megahertz of licensed spectrum) to more than 1 Gbps (relying on LAA with a combination of other technologies).²⁹ Verizon and T-

²⁴ Susan Rambo, *AT&T Grows its Gigabit LTE-Based 5G Evolution*, RCRWIRELESS (April 22, 2018) at <https://www.rcrwireless.com/20180422/wireless/att-grows-gigabit-lte-based-5g-evolution-tag41>.

²⁵ Sean Kinney, *Verizon Tallies More Than 1,100 Markets with LTE-Advanced*, RCRWIRELESS (July 16, 2018), <https://www.rcrwireless.com/20180716/network-infrastructure/lte/verizon-lte-advanced-tag17>.

²⁶ LTE-U, which did not go through the normal 3GPP standards-setting process, reached the market first.

²⁷ Keith Mallinson, *Analyst Angle: How to Provide Gigabit LTE Cheaply When You Don’t Have the Spectrum?*, RCRWIRELESS (Jan. 15, 2018), <https://www.rcrwireless.com/20180114/analyst-angle/analyst-angle-how-to-provide-gigabit-lte-cheaply-when-you-dont-have-the-spectrum-tag9>. See also, *T-Mobile seeing 5-10x increase in speeds thanks to LAA*, FIERCE WIRELESS (Feb. 12, 2018) at <https://www.fiercewireless.com/wireless/t-mobile-seeing-5-10x-increase-speeds-thanks-to-laa>.

²⁸ Kelly Hill, *Four Pillars of 5G*, RCRWIRELESS (Dec. 4, 2017), <https://www.rcrwireless.com/20171130/test-and-measurement/four-pillars-of-5g-tag6-tag99>.

²⁹ Diana Goovaerts, *Sprint Enters LAA Race*, MOBILE WORLD LIVE (Dec. 11, 2017), <https://www.mobileworldlive.com/featured-content/top-three/sprint-enters-laa-race/>.

Mobile plan widespread deployment of LAA in 2018, and AT&T has indicated that 24 markets will be covered by year-end.³⁰

Furthermore, MIMO, which groups multiple antennas at the transmitter and receiver to provide better throughput and spectral efficiency, is another 5G-precursor technology that is currently being introduced to expand the capacity of existing LTE networks.³¹ The larger number of transmitters enables beamforming, which allows the signal to be aimed towards the mobile unit using accurate and narrow beams. This reduces interference and improves signal quality, providing expanded cell coverage and capacity.³² In addition, the wireless industry is implementing numerous methods and technologies to enhance and improve their existing 4G LTE networks. Verizon has launched carrier aggregation in more than 2,000 markets, and additional enhancements like 4x4 MIMO and 256 Quadrature Amplitude Modulation (QAM) in 1,100 markets to increase the capacity and speed of customers' data sessions, and is working to deploy small cells to densify their network to improve targeted coverage and meet growing demand.³³ Sprint, which has already announced plans to launch commercial massive MIMO

³⁰ *Id.*; see also *AT&T Builds on 5G Foundation in More than 100 New Markets*, AT&T Newsroom (Apr. 20, 2018), http://about.att.com/story/att_builds_on_5g_foundation_in_more_than_100_new_markets.html; See also, *T-Mobile seeing 5-10x increase in speeds thanks to LAA*, FIERCE WIRELESS (Feb. 12, 2018) <https://www.fiercewireless.com/wireless/t-mobile-seeing-5-10x-increase-speeds-thanks-to-laa>.

³¹ Sean Kinney, *What Is Massive MIMO?*, RCRWIRELESS (June 28, 2017), www.rcrwireless.com/20170628/5g/what-is-massive-mimo-tag17-tag99.

³² DARYL SCHOOLAR, OVUM, *MASSIVE MIMO COMES OF AGE 3* (2017), <https://images.samsung.com/is/content/samsung/p5/global/business/networks/insights/white-paper/massive-mimo-comes-of-age/global-networks-insight-massive-mimo-comes-of-age-0.pdf>.

³³ Press Release, Verizon, *Verizon Continues Industry-Leading LTE Advanced Network Deployments* (July 13, 2018), available at <https://www.verizon.com/about/news/verizon-continues-industry-leading-lte-advanced-network-deployments>; Press Release, Verizon,

operations later this year, conducted field trials with Samsung last year and was able to increase channel capacity by 300 percent and boost cell edge performance by 200 percent, achieving peak speeds of over 300 Mbps using a single 20-megahertz channel.³⁴ Commercial smartphones that support massive MIMO are being introduced this year.³⁵

Nationwide wireless carriers have also announced plans for 5G commercial deployments in various cities, as well as additional trials. For instance, Verizon has announced four *residential* 5G broadband deployments across America for 2018,³⁶ and recently achieved a major technological breakthrough in the first successful transmission of a 3GPP New Radio (NR) 5G signal to a receiver situated in a moving vehicle.³⁷ T-Mobile announced buildout in 30 cities in 2018³⁸ while entering into a \$3.5 billion investment in 5G network equipment.³⁹

Densification: More Capacity to the Same Network (Apr. 9, 2018), <https://www.verizon.com/about/news/densification-more-capacity-same-network>.

³⁴ Susan Rambo, *Sprint's 5G Strategy: Massive MIMO Key to 2.5 GHz Rollout*, RCRWIRELESS (May 16, 2018), <https://www.rcrwireless.com/20180516/5g/sprints-5g-strategy-massive-mimo-key-to-2-5-ghz-rollout-tag41>; Sean Kinney, *What is Massive MIMO?*, RCRWIRELESS (June 28, 2017), www.rcrwireless.com/20170628/5g/what-is-massive-mimo-tag17-tag99.

³⁵ Sean Kinney, *Three Operator Trends to Watch in 2018*, RCRWIRELESS (Feb. 5, 2018), <https://www.rcrwireless.com/20180205/carriers/three-operator-trends-to-watch-in-2018-tag17-tag99>.

³⁶ Press Release, Verizon, Verizon 5G Internet Service Coming to Indianapolis (Aug. 14, 2018), <https://www.verizon.com/about/news/verizon-5g-home-internet-service-coming-indianapolis>.

³⁷ Press Release, Verizon, 5G on the Move: Verizon and Nokia Complete First 5G NR Mobility Call (Aug. 17, 2018), <https://www.verizon.com/about/news/5g-move-verizon-and-nokia-complete-first-5g-nr-mobility-call>.

³⁸ Press Release, T-Mobile, T-Mobile Building Out 5G in 30 Cities This Year ... and That's Just the Start (Feb. 26, 2018), <https://www.t-mobile.com/news/mwc-2018-5g>.

³⁹ Press Release, T-Mobile, T-Mobile and Nokia Ink \$3.5 Billion, Multi-year 5G Network Agreement (July 30, 2018), <https://www.t-mobile.com/news/nokia-5g-agreement>.

AT&T announced the launch of its 5G Evolution product in over 100 new markets.⁴⁰ In addition, Sprint revealed it would bring the “first mobile 5G smartphone [to] the U.S. in the first half of 2019.”⁴¹ Regional carriers are making strides as well, with more and more trials announced. U.S. Cellular—after a range of 5G testing efforts in 2016⁴² and 2017⁴³—is set to conduct trials this year using standards-based 5G equipment for the first time.⁴⁴ All these 5G networks will support local industries such as agriculture, as well as telehealth and telemedicine applications that can bring state-of-the-art medical care to consumers with limited access to medical services.

In addition to traditional network operators, new entrants are also moving quickly to deploy 5G networks. Charter Communications is testing 5G fixed wireless service in six

⁴⁰ Press Release, AT&T, AT&T Builds on 5G Foundation in More Than 100 New Markets (Apr. 20, 2018), http://about.att.com/story/att_builds_on_5g_foundation_in_more_than_100_new_markets.html.

⁴¹ Press Release, Sprint, Sprint and LG Working Together to Bring First 5G Smartphone to U.S. in First Half 2019 (Aug. 14, 2018), <http://sprintv12.tekgroupweb.com/sprint-and-lg-working-together-to-bring-first-5g-smartphone-to-us-in-first-half-2019.htm>.

⁴² Press Release, U.S. Cellular, Nokia and U.S. Cellular Test 5G Technologies for Fixed Wireless (Oct. 12, 2016), <https://www.uscellular.com/about/press-room/2016/Nokia-and-USCellular-test-5G-technologies-for-fixed-wireless.html>.

⁴³ Press Release, U.S. Cellular, U.S. Cellular EXPANDS 5G TESTS WITH ERICSSON TO 28 GHz (Oct. 24, 2017), <https://www.uscellular.com/about/press-room/2017/USCellular-EXPANDS-5G-TESTS-WITH-ERICSSON-TO-28GHZ.html>.

⁴⁴ Diana Goovaerts, *US Cellular CTO Charts Course to 5G*, MOBILE WORLD LIVE (July 13, 2018), <https://www.mobileworldlive.com/featured-content/top-three/us-cellular-cto-charts-course-to-5g/>.

markets using 3.5 GHz band spectrum,⁴⁵ and Comcast is reportedly conducting field-testing of 5G service as well.⁴⁶ Starry launched a 200 Mbps “pre-standard 5G, point-to-multipoint fixed wireless” service in three markets this year, and plans to expand into 16 markets by the end of 2018.⁴⁷ Even non-communications companies like Facebook are investing in 5G. For instance, Facebook has partnered with several firms including Deutsche Telekom, SK Telecom, Intel, and Nokia through its Telecom Infra Project to accelerate 5G research and development.⁴⁸

The commitment to accelerating the build-out of 5G goes beyond operators, as manufacturers and software developers have pressed ahead with laying the foundation for 5G, finalizing the 5G NR standard, developing and trialing 5G equipment in concert with service providers, and signing contracts for deployment of new infrastructure elements.⁴⁹ Most recently,

⁴⁵ Juan Pedro Tomás, *Charter Communications Testing 5G in Six U.S. Markets*, RCRWIRELESS (Jan. 29, 2018), <https://www.rcrwireless.com/20180129/5g/charter-communications-testing-5g-in-us-tag23>.

⁴⁶ Daniel Frankel, *Comcast’s Watson: “We’re very confident in our ability to compete” with 5G*, FIERCECABLE (Apr. 27, 2018), <https://www.fiercecable.com/cable/comcast-s-watson-we-re-veryconfident-our-ability-to-compete-5g>.

⁴⁷ Mike Dano, *Starry to Expand Its \$50/200 Mbps Fixed Wireless Service to 16 Major Markets During 2018*, FIERCEWIRELESS (Jan. 4, 2018), <https://www.fiercewireless.com/5g/starry-to-expand-its-50-200-mbps-fixed-wireless-service-to-16-major-markets-during-2018>.

⁴⁸ Sean Kinney, *Facebook Telecom Infra Project Hones 5G Focus*, RCRWIRELESS (Nov. 8, 2017), <https://www.rcrwireless.com/20171108/5g/facebook-telecom-infra-project-5g-tag17>; Michael Reilly, *Facebook Enters the Race to Build 5G Networks*, MIT TECH. R. (Feb. 22, 2016), <https://www.technologyreview.com/s/600875/facebook-enters-the-race-to-build-5g-networks/>.

⁴⁹ See e.g., Monica Allevén, *3GPP puts finishing touch on Standalone version of 5G standard*, FIERCEWIRELESS (June 14, 2018), available at <https://www.fiercewireless.com/wireless/3gpp-puts-finishing-touch-standalone-version-5g-standard>. See also Anjali Athavaley, *AT&T to expand 5G U.S. broadband trials*, Reuters (Aug. 30, 2017), available at <https://www.reuters.com/article/us-at-t-5g/att-to-expand-5g-u-s-broadband-trials-idUSKCN1BA1C4> (AT&T working with Ericsson, Samsung Electronics Co Ltd, Nokia and Intel Corp on trials); Monica Allevén, *Samsung snags Houston 5G market with Verizon*, FIERCEWIRELESS (July 25, 2018), available at <https://www.fiercewireless.com/wireless/samsung->

Ericsson announced they are “strengthening” their investment in the U.S., including in R&D, new software development facilities, and manufacturing 5G products in the U.S. by the end of this year, in order to “increase flexibility to shorten the timeline for new product introduction and product delivery to customers.”⁵⁰

C. Mobile Wireless Services Have Become Central to American Consumers’ Lives as the Wireless Industry Continues to Innovate and Deploy.

The reasonable and timely nature of broadband deployment has also allowed wireless services and devices to become central to consumers’ daily lives. Consumers increasingly use their wireless devices to make daily tasks easier and to access information—including critical data on topics as wide-ranging as employment opportunities, news, healthcare, transportation, public safety, entrepreneurship, and education. Over half of users also utilize their mobile device to shop, share photos, check the weather, and manage their finances.⁵¹ Mobile devices support users’ engagement with social media, enabling them to download terabytes of data, tweet millions of messages, and exchange content and commentary instantaneously. On average, consumers spend 177 minutes on their phones each day, scrolling and swiping through

[snags-houston-5g-market-verizon](#); and see *Nokia, T-Mobile US agree \$3.5 bln, deal, world’s first big 5G award*, Reuters (July 30, 2018), available at <https://www.cnn.com/2018/07/30/reuters-america-update-1-nokia-t-mobile-us-agree-3-point-5-blnd-deal-worlds-first-big-5g-award.html>.

⁵⁰ Press Release, Ericsson, Ericsson increasing US investments to support accelerated 5G deployments (Aug. 10, 2018) available at <https://www.ericsson.com/en/press-releases/2018/8/ericsson-increasing-us-investments-to-support-accelerated-5g-deployments>.

⁵¹ See *Leading Mobile-First Online Activities as of 2nd Quarter 2017*, STATISTA, <https://www.statista.com/statistics/783357/leading-mobile-first-activities/> (last visited Aug. 23, 2018).

applications and content in between other tasks about 150 times a day.⁵² And consumption of mobile video and live streaming continues to grow at a staggering pace.⁵³

A staggering 95 percent of Americans now own a mobile device of some kind,⁵⁴ and smartphone adoption is up across demographics.⁵⁵ Indeed, many consumers rely almost exclusively on their wireless connection; one in five U.S. adults is a “smartphone-only” internet user.⁵⁶ This trend is particularly pronounced among Hispanics, African-Americans, young adults, and low-income individuals.⁵⁷

The expanding availability and adoption of mobile broadband has benefitted consumers across all sectors of the economy, including rural and low-income consumers, people with disabilities, older adults, and veterans. The wireless industry’s efforts to expand mobile broadband availability have especially benefited rural Americans; over the past five years, more than 1.5 million additional rural Americans have been covered by mobile broadband.⁵⁸ As a

⁵² See Brian Solis, *Customers Are Increasingly Mobile-First, Yet Mobile Websites Are Sending Visitors Away*, FORBES (Mar. 22, 2018), <https://www.forbes.com/sites/briansolis/2018/03/22/customers-areincreasingly-mobile-first-yet-mobile-websites-are-sending-visitors-away/#42abb9d73e32>.

⁵³ See *Number of Mobile Phone Video Viewers in the United States from 2014 to 2020*, STATISTA, <https://www.statista.com/statistics/209348/mobile-video-viewers-in-the-united-states/> (last visited Aug. 23, 2018).

⁵⁴ *Mobile Fact Sheet*, PEW RESEARCH CTR.—INTERNET & TECH. (Feb. 5, 2018), <http://www.pewinternet.org/fact-sheet/mobile/>.

⁵⁵ *Cf. id.*

⁵⁶ *See id.*

⁵⁷ *Id.*

⁵⁸ STATE OF WIRELESS 2018 at 14.

result, almost 99 percent of rural Americans now have access to a 4G provider.⁵⁹ In addition, facilities-based providers and mobile virtual network operators (MVNOs) alike offer specialized packages to price-conscious consumers.⁶⁰

Moreover, wireless providers offer a number of plans that are useful to consumers with disabilities. For instance, carriers offer a number of service plans at varying price points for individuals who do not use voice minutes to communicate, including consumers with hearing or speech disabilities.⁶¹ The wireless industry is also leading the rapid deployment of real-time text (RTT) on IP-enabled networks to replace 20th-century teletypewriters (TTY) with the benefits and flexibility of 21st-century communications capabilities for people who are deaf, hard of hearing, or speech impaired.⁶² And the next generation of wireless, 5G, is expected to further

⁵⁹ See, e.g., Kevin Ryan, *Bringing Wireless to Rural America*, CTIA (Dec. 18, 2017), <https://www.ctia.org/news/bringing-wireless-to-rural-america>.

⁶⁰ See CTIA Mobile Competition Comments at 8-9.

⁶¹ See, e.g., *Nationwide Messaging Plans*, VERIZON, <https://www.verizonwireless.com/support/nationwide-faqs> (last visited Aug. 23, 2018) (making note of plans designed specifically for individuals who communicate using non-voice functions); See also, *Basic and Feature Phone Accessibility Plans*, AT&T, <https://www.att.com/shopcms/media/att/2016/shop/wireless/landing/disability-aging/pdf/PDF-Basic-and-feature-phone-accessibility-plans.pdf> (last visited Aug. 23, 2018); See also, *Sprint Accessibility – Wireless*, SPRINT, <https://www.sprint.com/en/shop/services/accessibility/wireless.html#sprint-relay-store> (last visited Aug. 23, 2018).

⁶² Indeed, the first RTT-capable devices appeared on AT&T's, Verizon's, and T-Mobile's networks as early as 2017. See *Accessibility Policy*, T-MOBILE, <https://www.t-mobile.com/customers/accessibility-policy> (last visited Aug. 23, 2018); See also, *Real-Time Text*, VERIZON, <http://www.verizon.com/about/accessibility/real-timetext> (last visited Aug. 23, 2018); See also, *AT&T Real-Time Text*, AT&T, <https://www.att.com/esupport/article.html#!/wireless/KM1233824> (last visited Aug. 23, 2018).

benefit the accessibility community.⁶³ The wireless industry also continues to offer service plans and devices designed with seniors in mind,⁶⁴ all while wireless providers are increasingly ensuring our nation's veterans and their families have access to reliable, affordable wireless connectivity.⁶⁵

D. The Rapid Growth in the Internet of Things Is Supported by the Reasonable and Timely Deployment of Mobile Wireless Broadband Services.

The ever-progressing deployment of mobile broadband networks also has led to the unprecedented growth of IoT. The number of IoT devices continues to grow approximately 20 percent per year, driven by new use cases; in 2018, the number of IoT devices will surpass the number of mobile phones, and by the end of 2023, analysts now predict that there will be more than 20 billion IoT devices worldwide.⁶⁶ These devices include connected cars, machines,

⁶³ See CTIA Mobile Competition Comments at 12.

⁶⁴ See, e.g., *Unlimited 55+*, T-MOBILE, <https://www.t-mobile.com/offers/t-mobile-one-unlimited-55> (last visited Aug. 23, 2018); *Change to AT&T Senior Nation Plan*, AT&T, <https://www.att.com/esupport/article.html#!/wireless/KM1009134> (last visited Aug. 23, 2018).

⁶⁵ For instance, T-Mobile, U.S. Cellular, GCI, AT&T, Sprint, and other providers offer specialized service plans and percentage discounts to the veteran community, and Verizon offers military families unlimited plans for as low as \$30/line with four lines per month. See *T-Mobile One Military*, T-MOBILE, <https://www.t-mobile.com/offers/military-phone-plans> (last visited Aug. 24, 2018); See also, *Military Discount*, U.S. CELLULAR, <https://www.uscellular.com/support/faq/military-discount.html> (last visited Aug. 24, 2018); See also, *Military Offers – We Appreciate Your Service*, GCI, <https://www.gci.com/offers/military-offers> (last visited Aug. 24, 2018); See also, *Unlimited Military – Sprint Salutes Veterans and Our Military!*, SPRINT, <https://businesssolutions.sprint.com/dod-military.html> (last visited Aug. 24, 2018); See also, *Military Discounts – The AT&T Signature Program*, AT&T, <https://www.att.com/offers/discount-program/military-discount/index.html> (last visited Aug. 24, 2018); *Now Military Families Save Even More*, VERIZON, <https://www.verizonwireless.com/military/> (last visited Aug. 24, 2018).

⁶⁶ See, e.g., *IoT Connections Outlook*, ERICSSON (Nov. 2017), <https://www.ericsson.com/en/mobility-report/reports/november-2017/internet-of-things-outlook>; See also, *The Zettabyte Era: Trends and Analysis*, CISCO (June 7, 2017),

meters, sensors, point-of-sale terminals, consumer electronics, and wearables. It is also estimated that by 2025, the average connected person is expected to interact with IoT devices every 18 seconds.⁶⁷ In light of this significant growth opportunity, wireless providers as well as cable operators and other new entrants are building next-generation networks to support IoT applications. In 2018 alone there have been numerous IoT network announcements spurred by competition between carriers and new entrants.⁶⁸

III. THE COMMISSION SHOULD CONSIDER AVAILABLE DATA, RATHER THAN RIGID BENCHMARKS, TO DETERMINE THAT MOBILE WIRELESS BROADBAND DEPLOYMENT IS REASONABLE AND TIMELY.

As the Commission rightly notes in the *NOI*, “in the mobile environment, adoption of a single speed benchmark [is] unworkable given the inherent variability of the mobile experience, combined with data limitations and methodological issues.”⁶⁹ Although the *NOI* proposes to estimate the availability of wireless services at benchmarks of 5/1 and 10/3 Mbps, using Form 477 and Ookla data,⁷⁰ rigid benchmarks are not well-suited for determining whether mobile wireless broadband deployment is reasonable and timely. As the Commission has observed, “mobile transmissions are subject to environmental factors that fixed line transmissions do not

<https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index/vni-hyperconnectivity-wp.html>.

⁶⁷ See DAVID REINSEL ET AL., IDC, DATA AGE 2025: THE EVOLUTION OF DATA TO LIFE-CRITICAL (Apr. 2017), <https://www.seagate.com/www-content/our-story/trends/files/Seagate-WP-DataAge2025-March-2017.pdf>.

⁶⁸ See, e.g., CTIA Mobile Competition Comments at 23-24 (enumerating IoT efforts from entities including T-Mobile, Verizon, DISH, and AT&T).

⁶⁹ *NOI* at 4-5 ¶ 9.

⁷⁰ *Id.*

encounter” and “encounter[] degrading effects from factors such as congestion, interference, and challenges presented by the physical velocity of the mobile antenna.”⁷¹ As a result of these and other factors, it is difficult to set such benchmarks against which to judge mobile wireless broadband networks.⁷²

Therefore, the Commission should focus on available data that demonstrates increasing consumer demand and use of mobile wireless services to make the statutory assessment. Specifically, the Commission should consider whether mobile broadband deployment is reasonable and timely with reference to whether it is improving and meeting consumers’ needs. As the data herein show, it is doing both.

A. The Data Show that Mobile Wireless Broadband Deployment Is Meeting and Exceeding Consumers’ Demands.

Mobile broadband providers are investing in expanding and deepening the capabilities of their networks, including upgrading existing facilities; deploying additional facilities in rural, urban and suburban areas across the country; and launching evolutionary upgrades. As noted above, this includes LTE, 5G evolution, and pre-operational 5G deployments.⁷³

⁷¹ *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act*, 2016 Broadband Progress Report, 31 FCC Rcd 699, 725 ¶ 61 (2015).

⁷² The selection of benchmarks for area eligibility and build-out standards for subsidies from MF-II is a very different question from the Section 706 inquiry into whether broadband deployment is reasonable and timely. As a result, the MF-II benchmarks should not inform this inquiry. *See NOI* ¶ 20.

⁷³ *See, e.g., supra* notes 21-44 and associated text.

Dramatically for a technology the Commission only began to include in its Mobile Wireless Competition Reports a scant three years ago,⁷⁴ 4G LTE service already covers more than six million U.S. road miles (*i.e.*, at least 92.6 percent of U.S. road miles, under the more conservative of the Commission’s methodologies).⁷⁵ Coupled with the covered population of U.S. citizens with access to 5/1 Mbps mobile LTE services growing from less than 90 percent in 2012 to 99.6 percent in 2016, the Commission’s own data clearly reveal the remarkable timely deployment that has occurred.⁷⁶

Wireless carriers have collectively and individually invested billions in their networks in their on-going deployment of LTE to boost network capacity and improve speed and reliability.⁷⁷ AT&T and Verizon increased their capex spending in the first quarter,⁷⁸ while T-Mobile has

⁷⁴ *Compare generally Eighteenth Mobile Competition Report*, 30 FCC Rcd at 14538 ¶ 35 (reporting on LTE mobile broadband services for the first time) with *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993*, Seventeenth Report, 29 FCC Rcd 15311, 15335 ¶ 50 (2014) (reporting on “mobile broadband coverage” using a sub-LTE definition).

⁷⁵ *Id.* at Tables III.D.iv and III.D.v (using the Commission’s Form 477 data and either centroid or actual area coverage models).

⁷⁶ *Id.* at Table 2a.

⁷⁷ Press Release, Verizon, Chicago Verizon Customers Have the #1 Rated Network (July 5, 2017), <https://www.verizon.com/about/news/chicago-verizon-customers-have-1-rated-network> (Verizon invests nearly half a billion dollars in Chicagoland over five years to improve 4G LTE network and provide foundation for the next generation network, 5G); Press Release, AT&T, AT&T Invests Nearly \$1.5 Billion Over 3-Year Period to Boost Local Networks in Houston (August 22, 2018), <https://www.prnewswire.com/news-releases/att-invests-nearly-1-5-billion-over-3-year-period-to-boost-local-networks-in-houston-300700409.html> (AT&T made 447 wireless network upgrades in the Houston area alone).

⁷⁸ Mike Dano, Verizon, AT&T show surprise increase in network spending in Q1, FIERCE WIRELESS (May 7, 2018), at <https://www.fiercewireless.com/5g/verizon-at-t-show-surprise-increase-network-spending-q1>. In 2016 Verizon’s XLTES network expansion doubled their 4G LTE bandwidth and increased peak speeds across nearly 2.4 million square miles. Verizon \$5B

been expanding its low-band LTE presence through its ongoing network investment, and Sprint has been adding 2.5 GHz spectrum – considered “key to its continued enhancement of LTE, as well as its 5G ambitions” – to two-thirds of its macro sites.⁷⁹ As service providers continue to upgrade their networks and the scope of areas covered by wireless services has increased, so too has consumers’ satisfaction with their mobile wireless broadband services. The American Consumer Satisfaction Index report on Wireless Telephone Service shows a score of 74 percent—up 1.4 percentage points from last year alone.⁸⁰ Consumers’ satisfaction can also be seen in their rapaciously growing consumption of mobile broadband. Total mobile data traffic in 2017 was up 14 percent over 2016, reaching 15.7 trillion MBs.⁸¹ Data traffic has quadrupled in the past three years and has increased 40-fold in the past seven.⁸² Considered on a per-user basis, monthly traffic per smartphone jumped from 3.9 GB to 5.1 GB, an astounding 30.7 percent increase for a single year.⁸³

wireless network investment helps enterprises (August 3, 2016), at <https://www.verizon.com/about/news/verizon-5b-wireless-network-investment-helps-enterprises>.

⁷⁹ *T-Mobile beefs up low-band LTE around country*, Seeking Alpha (August 24, 2018), at <https://seekingalpha.com/news/3385700-t-mobile-beefs-low-band-lte-around-country>. Sean Kinney, *Sprint reports wireless growth as network investment plan continues*, RCR Wireless (August 1, 2018), at <https://www.rcrwireless.com/20180801/business/sprint-network-investment-plan-tag17>.

⁸⁰ See AM. CUSTOMER SATISFACTION INDEX, BENCHMARKS BY INDUSTRY (2018), https://www.theacsi.org/index.php?option=com_content&view=article&id=148&Itemid=213.

⁸¹ *CTIA Wireless Industry Indices Report* (2018).

⁸² *Id.*

⁸³ *Id.*

Because mobile wireless broadband networks are expanding consistently and meeting or exceeding consumer demands and expectations, the only plausible determination is that mobile wireless broadband deployment is both reasonable and timely.

B. CTIA Continues to Support the Commission’s Efforts to Enhance the Quality of Public Data on Broadband Availability, Including Through the Form 477 Data Collection Process.

CTIA agrees that good data make good policy,⁸⁴ particularly with respect to distributing limited federal universal services funds to rural areas without access to mobile wireless broadband services. To that end, the Commission’s one-time MF-II data collection provides a unique opportunity to gain greater understanding about the challenges of measuring mobile broadband coverage. The Commission’s efforts to implement a challenge process for MF-II will yield helpful information to improve the overall mapping process.⁸⁵ CTIA has encouraged the Commission to consider lessons learned in the MF-II challenge process as it considers whether and how to make changes to the Form 477 process, once the agency has had time to evaluate the new data gathered.⁸⁶

⁸⁴ See, e.g., Ajit Pai, Chairman, FCC, Remarks at the Hudson Institute: The Importance of Economic Analysis at the FCC (Apr. 5, 2017), <https://docs.fcc.gov/public/attachments/DOC-344248A1.pdf> (“In baseball, as at the FCC, using analytics doesn’t dictate what your choices will be. But not using it means your decisions are more likely to go wrong.”).

⁸⁵ See, e.g., *Connect America Fund, Universal Service Reform – Mobility Fund*, Order on Reconsideration and Second Report and Order, 32 FCC Rcd 6282 (2017) (*MF-II Challenge Process Order*); see also, *Connect America Fund, Universal Service Reform – Mobility Fund*, Order, Notice of Proposed Rulemaking, and Memorandum Opinion and Order, WC Docket Nos. 10-90, -208, FCC 18-124 (rel. Aug. 21, 2018) (extending the MF-II challenge window by 90 days).

⁸⁶ Cf. CTIA 477 Comments at 5-7.

While CTIA supports the Commission's efforts to continually refine its understanding of broadband coverage, given the substantial evidence of the rapid and consumer-satisfying pace of mobile wireless broadband deployment, the necessity of an affirmative finding in the forthcoming Report is clear.

IV. TO ENSURE MOBILE WIRELESS BROADBAND DEPLOYMENT REMAINS REASONABLE AND TIMELY, THE COMMISSION SHOULD MAINTAIN A PRO-DEPLOYMENT REGULATORY ENVIRONMENT.

Over the course of the past year, the Commission has sought to establish regulatory policies that promote investment. Key among these, the *Restoring Internet Freedom Order* was an important step to release the broadband marketplace, including mobile broadband, from investment-chilling utility-style regulation.⁸⁷ It restored the longstanding bipartisan approach to the internet's classification, and is helping to drive billions of new dollars into mobile broadband networks, boost our economy, and ensure that we continue to lead the world in mobile wireless services. The Commission should be proud of its achievement in taking this crucial pro-growth regulatory step.

CTIA also commends the Commission for the significant progress it has made in modernizing its siting policies to reflect the changing network architecture needed to create capacity for 4G LTE networks and to support next-generation deployments.⁸⁸ CTIA also

⁸⁷ See *Restoring Internet Freedom Order*, 33 FCC Rcd at 364-93 ¶¶ 88-139 (describing the substantial costs imposed under the previous regime, and why utility-style regulation is a solution in search of a problem); *id.* at 424-25 ¶¶ 187-91 (describing the effects of utility-style regulation on wireless infrastructure in particular).

⁸⁸ See *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Report and Order, 32 FCC Rcd 9760 (2017); See also *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, Report and Order, Declaratory Ruling, and Further Notice of Proposed Rulemaking, 32 FCC Rcd 11128 (2017); See also *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Second Report and Order, WT Docket No. 17-79, FCC 18-30 (rel. Mar. 30, 2018)

appreciates the Commission’s progress in scheduling the first high-band auctions, the first of which will start this year;⁸⁹ exploring additional high-band spectrum for terrestrial wireless use;⁹⁰ and identifying and making available mid-band spectrum, which will be critical to U.S. 5G success.⁹¹

To maintain the forward momentum there are additional steps that the Commission can take to help ensure the deployment of advanced telecommunications capability remains reasonable and timely for mobile customers. To that end, the Commission can and should consider and act upon the following recommendations.

A. The Commission Should Continue to Modernize its Siting Policies to Advance the Deployment of Wireless Infrastructure.

Expanding the availability of wireless connectivity requires additional massive investment in wireless networks. That investment in turn depends on federal, state, and local siting policies that promote—not impede—deployment of needed new infrastructure.

The Commission has already taken important actions to remove regulatory barriers and update its rules to reflect the scope and scale of new network technologies. In particular, the Commission’s updated environmental and historic preservation rules have already led to

(“*Wireless Infrastructure Second R&O*”); *Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, Third Report and Order and Declaratory Ruling, WC Docket No. 17-84, FCC 18-111 (rel. Aug. 3, 2018) (“*Wireline Infrastructure Third R&O*”).

⁸⁹ See *Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services et al.*, Public Notice, AU Docket No. 18-85, FCC 18-109 (rel. Aug. 3, 2018).

⁹⁰ See, e.g., *Spectrum Horizons et al.*, Notice of Proposed Rulemaking and Order, 33 FCC Rcd 2438 (2018).

⁹¹ See, e.g., *Expanding Flexible Use of the 3.7 to 4.2 GHz Band et al.*, Order and Notice of Proposed Rulemaking, GN Docket No. 18-122 *et al.*, FCC 18-91 (rel. July 13, 2018).

additional wireless deployment by removing unnecessary barriers designed for 200-foot towers that need not apply to small cell facilities.⁹² And the Commission’s clarification that moratoria, both express and *de facto*, are prohibited by the Communications Act will likewise prove valuable by ensuring that state and local governments act on requests to site wireless infrastructure.⁹³ Most recently, the Commission circulated a draft order which will adopt reasonable guardrails on local siting regulations, by requiring that local siting fees and charges be cost-based, shortening the existing shot clocks for localities to act on siting applications, and requiring that localities’ aesthetic regulations be reasonable, nondiscriminatory and publicly disclosed.⁹⁴ CTIA commends the Commission for these and other actions, which will reduce the time and cost of deployment and thus speed new wireless infrastructure.

The substantial record the Commission has built in these proceedings also supports taking additional steps that can reduce barriers to next generation wireless deployments. CTIA continues to urge the Commission to address several other types of regulations or requirements that have been identified by industry as substantially delaying or deterring service. These include denials of access to municipal-owned utility poles and other structures, requirements that all facilities along rights-of-way be underground, and requirements to prove a service coverage gap or other business need for new facilities.

⁹² See *Wireless Infrastructure Second R&O*.

⁹³ See *Wireline Infrastructure Third R&O*.

⁹⁴ See *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment*, Fourth Report and Order, WT Docket No. 17-79 (CIRC1809-02, circulated Sept. 5, 2018).

B. Allocating More Low-, Mid-, and High-Band Spectrum for Exclusive Licensed Use Remains Critical to Continued Reasonable and Timely Deployment of Mobile Broadband.

The Commission, the National Telecommunications and Information Administration (NTIA), and other agencies have done important work in the last few years to make spectrum available for wireless broadband. In particular, CTIA applauds recent Commission efforts to meet consumer demand and ensure the U.S. is 5G-ready by scheduling the upcoming auctions of the 28 GHz band (Auction 101), which will start on November 14, 2018, and the 24 GHz band (Auction 102), and through the Chairman's announcement that three more millimeter-wave spectrum bands—the 37 GHz, 39 GHz, and 47 GHz bands—will be auctioned in the second half of 2019.⁹⁵ These are important steps. Looking ahead, CTIA appreciates that the Commission is exploring additional high-band opportunities for terrestrial wireless use. The faster the Commission identifies additional bands for 5G use, the faster that spectrum can be put to use for the benefit of consumers.

The U.S. must also work to free up valuable mid-band spectrum for 5G use as quickly as possible, just as other nations around the world are doing. Specifically, the Commission should first revise the 3.5 GHz band licensing rules to adopt larger license sizes, ten-year license terms, and an expectation of renewal. These steps will promote economies of scale and maximize long-term investment in the 3.5 GHz band.

Second, fast-tracking the repurposing of the 3.7-4.2 GHz spectrum, including maximizing the amount of spectrum available for wireless broadband, setting aggressive timelines for a final decision, and pushing stakeholders to work collaboratively, will provide U.S. wireless broadband providers access to spectrum targeted for 5G use globally.

⁹⁵ See *supra* note 89.

Finally, working with NTIA to identify additional bands, such as the 3450-3550 MHz band, for potential commercial wireless use will be critical to meeting the spectrum requirements of the Mobile Now Act.⁹⁶

Low-band spectrum also continues to serve as the cornerstone of effective 4G LTE coverage and the bedrock of any nationwide wireless network deployment; as noted above, it will serve as an important piece in the 5G puzzle.⁹⁷ Maintaining the 39-month transition timeline following the close of the incentive auction will ensure that 600 MHz spectrum is in the hands of mobile operators—and deployed to consumers—as quickly as possible, and will avoid significant opportunity costs.

C. The Commission Should Move Forward With Mobility Fund Support for Unserved Rural Areas.

CTIA shares the Commission’s commitment to delivering mobile wireless services to unserved areas of the United States, and commends the Commission’s work to move towards implementation of MF-II as an effective means of helping to ensure that mobile broadband deployment remains reasonable and timely.⁹⁸ The MF-II auction—and its \$4.53 billion over ten

⁹⁶ See Consolidated Appropriations Act, 2018, P.L. 115-141, Division P, the Repack Airwaves Yielding Better Access for Users of Modern Services (RAY BAUM’S) Act. Title VI of the RAY BAUM’S Act is the Making Opportunities for Broadband Investment and Limiting Excessive and Needless Obstacles to Wireless, or MOBILE NOW, Act.

⁹⁷ See, e.g., Ajit Pai, *Scoring a Victory for 5G*, FCC (June 20, 2018), <https://www.fcc.gov/news-events/blog/2018/06/20/scoring-victory-5g> (“When it comes to 5G, we need to keep the playbook fresh and forward leaning. ... Our spectrum strategy calls for making low-band, mid-band, and high-band airwaves available for flexible use.”); see also Jessica Rosenworcel, *It’s Time to Chart a Course for 5G Success*, TECHCRUNCH (Jan. 10, 2018), <https://techcrunch.com/2018/01/10/its-time-to-chart-a-course-for-5g-success/> (In discussing “when and how the FCC will auction new airwaves to support 5G service,” describing how the Commission “can resolve outstanding issues in our mid-band spectrum rule-makings”).

⁹⁸ See, e.g., Ajit Pai, Chairman, FCC, Remarks at the Kansas Broadband Conference, at 3 (Sept. 21, 2017), *available at*

years for the deployment of 4G LTE⁹⁹—is an important step toward that goal. A robust and efficient Mobility Fund will enable wireless providers to preserve and extend 4G LTE coverage to the hardest-to-serve areas where consumers lack access to critical mobile wireless broadband services.

Even with all of the evidence about the extensive deployment of mobile broadband networks discussed above, many rural areas remain unserved by 4G LTE services. The Commission has identified a preliminary list of such areas through a targeted data collection, and is refining this information through a challenge process.¹⁰⁰ In such areas, targeted universal service support such as MF-II can play a critical role in ensuring that all Americans have reasonably comparable access to mobile broadband services. For this reason, CTIA encourages the Commission to continue making timely progress on implementation of MF-II, including holding the MF-II auction as soon as practicable.¹⁰¹

V. CONCLUSION.

Using any rational method for quantification, the deployment of mobile broadband has been—and continues to be—reasonable and timely, as the Commission’s *2018 Broadband*

http://transition.fcc.gov/Daily_Releases/Daily_Business/2017/db0921/DOC-346838A1.pdf (describing how the new Mobility Fund is designed “to spur network deployment in sparsely populated areas where the economic incentives for private investment don’t exist.”).

⁹⁹ See *MF-II Challenge Process Order*, 32 FCC Rcd at 6289 ¶ 14.

¹⁰⁰ See, e.g., *MF-II Initial Eligible Areas Map Public Notice Procedures for the Mobility Fund Phase II Challenge Process*, Public Notice, 33 FCC Rcd 1985, 1990-92 ¶¶ 11-13 (WCB/WTB 2018).

¹⁰¹ See, e.g., Letter from Matthew Gerst, Assistant Vice President – Regulatory Affairs, CTIA, to Marlene H. Dortch, Secretary, FCC, WC Docket Nos. 10-90, -208 (filed Jan. 12, 2018) (describing CTIA’s firm support for the MF-II auction and urging the agency to “expeditiously move forward to auction federal universal service funds to support the deployment of 4G-LTE mobile wireless broadband to unserved rural and other high-cost areas”).

Progress Report concluded and its next report should conclude. The Commission can and should help ensure that the reasonable and timely deployment of mobile wireless broadband continues through targeted, balanced regulatory action in the specific areas described above.

Respectfully submitted,

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